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PLAN OF STUDY IN CONNECTION WITH DRAINED WEIGHTS OF
CANNED FREESTONE PEACHES

The Problem and Need for Work

Satisfactory drained weights of canned fruits traditionally have been considered as indicative of cans properly filled with fruit and which have been properly processed and handled. The drained weight of the product, therefore, serves as a guide for processors, buyers, and sellers in the packing and marketing of the product. In most grade standards for canned fruits minimum drained weights are recommended and in the case of purchase specifications they are required. In the case of canned Freestone peaches, however, they are not now included in the grade standards or Federal Specifications.

There has been a noticeable variation in the drained weights of Freestone peaches in different packs and in different locations. This variation has caused frequent requests for providing specific minimum drained weights for purchase specifications and questions as to why drained weight recommendations were not included in the grade standards for Freestone peaches. While processors in the past have indicated that the variations are caused by factors over which they have no control, more recent data indicate that improved methods of handling and processing now enable processors to reduce the variation in the drained weight of Freestone peaches.

If fair and equitable minimum drained weights could be developed for Freestone peaches, their inclusion in grade standards and specifications would serve as guides for good packing practice and provide

a better basis for trading between buyers and sellers. Such proper and uniform drained weights would reduce consumer complaints of excess amount of syrup in relation to the amount of fruit and improve the acceptance of the product generally.

The standardization problem is to determine if properly packed cans of Freestone peaches will show fairly uniform drained weights after processing.

Any recommended or required drained weight for canned fruits packed in syrup is subject to variation until the fruit and syrup solids have become equalized. If recommended drained weights for Freestone peaches are developed, it would be desirable to establish a minimum time after packing for setting such drained weight, regardless of further fluctuations. This time should be as near to date of packing as possible, 15 days or 30 days. Establishing recommended drained weights at a definite time would tend to eliminate many controversies in marketing Freestone peaches.

Information Previously Developed

Data, principally average in-going fruit weights and average cut-out drained weights at about 24 hours, seem to indicate that there is more loss of weight initially on this product than on many other products. Information about the amount of pick-up in drained weight which may be expected at various times after packing is limited. Also up-to-date information on the amount of variation in drained weight which can be expected from well filled and identically processed cans is very meager. Recent preliminary studies made by the inspection

service indicate a definite relationship between the fill-in weight of fruit and the drained weight of identically packed samples, but additional data is needed.

Objectives

The objectives of the project are to obtain data for developing recommended minimum drained weights of Freestone peaches and to study the relationship of syrup density and size of units and time of cutting on the drained weight. If fair and equitable drained weights for Freestone peaches can be developed they would be given a period of trial and if found practical, incorporated as recommendations in the United States grade standards and as requirements for Federal Specifications for Freestone peaches.

Cooperation

Since the results of these studies may lead to the production of more acceptable products and improve marketing of Freestone peaches, it is believed that there should be a participation in the study by the interested groups. Agreements have been reached whereby the project will be handled cooperatively by the Processed Products Standardization and Inspection Branch, and the Cannery League of California with respect to California, with the assistance of the National Cannery Association. Similar arrangements are being made with the Northwest Cannery Association for work in the Northwest, and with the Michigan State Cannery Association in Michigan. Cannery packing the items are being invited to cooperate in each area.

Plan of the study.

It was believed that the objectives of this study could best be achieved by studying the actual behavior of properly filled samples of the product, the fill to be agreed on by a committee composed of a representative of the USDA and one from each of the cooperating associations. This plan was unacceptable to the Cannery League of California because they felt the results should be based on usual commercial practice instead of controlled filling.

The following plan was agreed on in conference:

(1) Secure samples from as many plants as are necessary to cover the variables to be studied. Make the studies in the principal sections of the country where Freestone peaches are processed and at several plants in each section if they are available. Secure samples of each item at two or more times during the season in order to study the variations in drained weights that might be caused by such conditions as area of production, moisture, and packing practices. It is believed that plants in Michigan, in the Northwest, and in California would provide a cross section of the various areas and methods of processing.

(2) Control all variables or determine the extent of the variation in each sample in order to properly evaluate the result. In California part of the study will be conducted by the Cannery League of California in cooperation with the National Cannery Association and part by the USDA in cooperation with canners having continuous inspection. All data thus developed will be coded and interchanged with the two groups.

Combined data will be circulated to the cooperators, including the cooperating canners, as soon as possible after completion of the study.

The fill of the containers of the samples studied will be determined by drawing samples at random from the lines and will therefore reflect the practice of that plant on that day. An evaluation of the fill of the container will be made and recorded for each can. This evaluation will be considered when averaging the complete data.

(3) At each plant pack a sample of 24 cans of each item to be studied so that 6 may be opened at 24 hours, 6 at 15 days, 6 at 30 days and 6 after 3 months. This procedure to be repeated one or more times during the season.

After processing all cans will be removed from the lines and stored in a manner so that any cooling will continue at approximately the same rate as other cans which are packed at the same time. Storing and handling will approximate commercial practice.

At approximately 24 hours after canning, one-fourth of the cans (normally 6 cans of each sampling) will be cut and drained by the standard USDA method. At 15 days another one-fourth of the cans will be drained in the same manner, another fourth at 30 days, and the remaining after 3 months. The draining may be done by USDA inspectors, if stationed at the plants.

Items to be Studied.

Possible combinations of variables which might affect the drained weights of canned Freestone peaches are so numerous that it is believed this study must be limited to those which commonly occur in normal packing operations. To provide a sufficient number of samples for proper analysis and for suitable conclusions, it is believed that a larger number of samples of normally produced items should be packed.

As many as possible of the following normally produced items, if available, should be packed at each plant and duplicated at least once during the season. The number actually packed will depend on the items being produced at the cooperating plants at the time the studies are made and the number of samples considered necessary to develop the information. Other combinations of variables may suggest themselves at any time during the study.

Item	1/	Number of #303 cans	Number of #2 $\frac{1}{2}$ cans	Number of #10 cans	TOTAL for (1 variety)	TOTAL X 4 varieties
1.	LH, Ex.Hvy., WR	0	24	12	36	144
2.	LH, Hvy., RR	0	24	12	36	144
3.	LH, Lht., FR	0	24	12	36	144
4.	SH, Ex.Hvy., WR	24	24	12	60	240
5.	SH, Hvy., RR	24	24	12	60	240
6.	SH, Lht., FR	24	24	12	60	240
7.	LS, Ex.Hvy., WR	24	24	12	60	240
8.	LS, Hvy., RR	24	24	12	60	240
9.	LS, Lht., FR	24	24	12	60	240
10.	SS, Ex.Hvy., WR	24	24	12	60	240
11.	SS, Hvy., RR	24	24	12	60	240
12.	SS, LHT., FR	24	24	12	60	240
TOTALS		216	288	144	648	2592

<u>1/</u>	LH - large halves.	Ex.Hvy. - Extra heavy syrup.
	SH - small halves.	Hvy. - heavy syrup.
	LS - large sliced.	Lht. - light syrup.
	SS - small sliced.	RR. - reasonably well ripened.
	WR - well ripened.	FR. - fairly well ripened.

For all four varieties and all 12 items, one plant would furnish 2,592 samples for one repetition. With plans to repeat the sampling later in the season, the above figure would be doubled.

Sizes of Halves	:	#2-1/2 Cans	:	#303 Cans	:	#10 Cans
	:		:		:	
Large	:	5-8 count	:		:	25-35 count
	:		:		:	
Small	:	9 and over	:	5-8 count	:	36 and over
	:		:		:	

Procedure. Samples will be packed during regular production runs at the cooperating canneries. The "items" selected for study will be those actually being produced commercially. The following operational procedures will be followed as nearly as possible when packing the samples.

Operating Procedure for Each Item. (An "item" is the variable being studied; for example, "2-1/2 cans, regular Elberta, extra heavy syrup, large slices, well-ripened fruit)

(1) Fill out all headings of data sheets and add any other information which could conceivably affect the drained weight of the samples.

(2)(a) At random and without regard to the apparent fill, select at least 25 cans from the filling lines after filling and before syruing:

(b) Drain each can 5 seconds to remove excessive liquid.

(c) Weigh and record (Sheet No. 1 - data sheets) the net weight of fruit in the can to the nearest 1/10 ounce and return cans to the line.

(3) (a) Select 24 cans of the item (12 cans for #10's) at random from the lines after filling and before syruiping.

(b) Drain each can 5 seconds.

(c) Evaluate the fill (always before weighing) of the container and record your evaluation in accordance with the following code:

OF - overfilled.

WF - a proper and acceptable commercial fill.

SU - slightly underfilled, i.e., could easily take 1 more half or an equivalent amount of slices.

UF - Seriously underfilled.

(d) Weigh and record the net weight of fruit to 1/10 ounce in the spaces provided in sheet No. 2 of the data sheets.

(e) Mark the can for identification.

(f) Return can to line and pick up after processing.

(4) Cut 6 cans at approximately 24 hours after canning, and record the information indicated on the data sheet. Follow USDA method. Remove excess syrup from screen between determinations by striking it against a flat surface. Do not re-weigh screen between drainings.

(5) Make arrangements for storing remaining cans at the factory for at least 7 days after canning, and for cutting 6 additional cans at 15 days, 6 at 30 days and 6 at 3 months. (3 cans in case of #10's).

(6) Sign the data sheet.



